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THE PROGRESS OF SCIENCE

MILITARY PREPAREDNESS

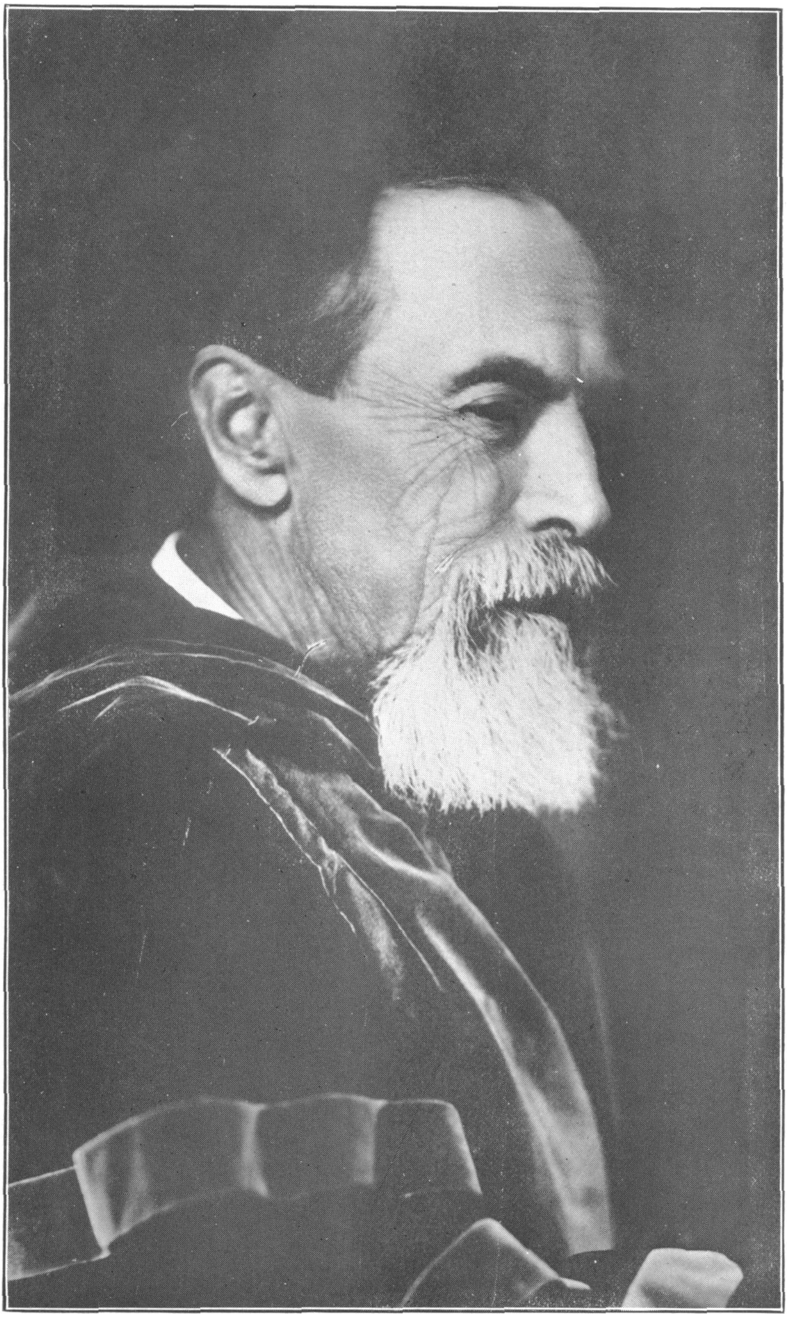
There is published in the present issue of the Monthly a series of papers on national defense and development presented before the Section of Social and Economic Science of the American Association for the Advancement of Science. It is not clear why one aspect of the subject was emphasized at the meeting, but it is doubtless desirable that the arguments for military preparedness should be represented in this journal, as well as the opposite point of view. An obvious difference exists between the eleven sections of the American Association devoted to the natural and exact sciences and the one devoted to the social and economic sciences. The former are in the main concerned with the discovery of truth, the latter in the main with the expression of opinion, and the same holds for the articles published in this journal. It would not indeed be desirable to include such diverse subjects in the same association and in the same journal, except for the fact that it is one of the most important of all objects to establish the scientific method in belief and in conduct.

It is, however, particularly difficult to make any progress in this direction at a time when the emotions are deeply stirred. The people of each of the European nations now at war believe sincerely that they are defending their country and their homes against cruel enemies that have long laid in wait wantonly to attack them. The responsibility for the war and the methods by which it is conducted are judged absolutely differently by Americans of English descent living in Boston and by Americans of German descent living in Milwaukee. It is believed by many that rivalry in armaments and in military and naval preparations intended for defense were the immediate cause of the present war and are likely to be the cause of future wars, yet nearly all the writers of the papers presented before the American Association and printed here argue that this country should increase its armaments and its military establishment in order to maintain peace.

The attempt of Germany to rival the British navy and the increased military preparations of Russia and of France may be regarded as at least among the causes leading to the present war. Nor is it evident that the efficiency for war of the different nations was proportional to their armaments. Their budgets in millions of dollars for the year just preceding the war were as follows:

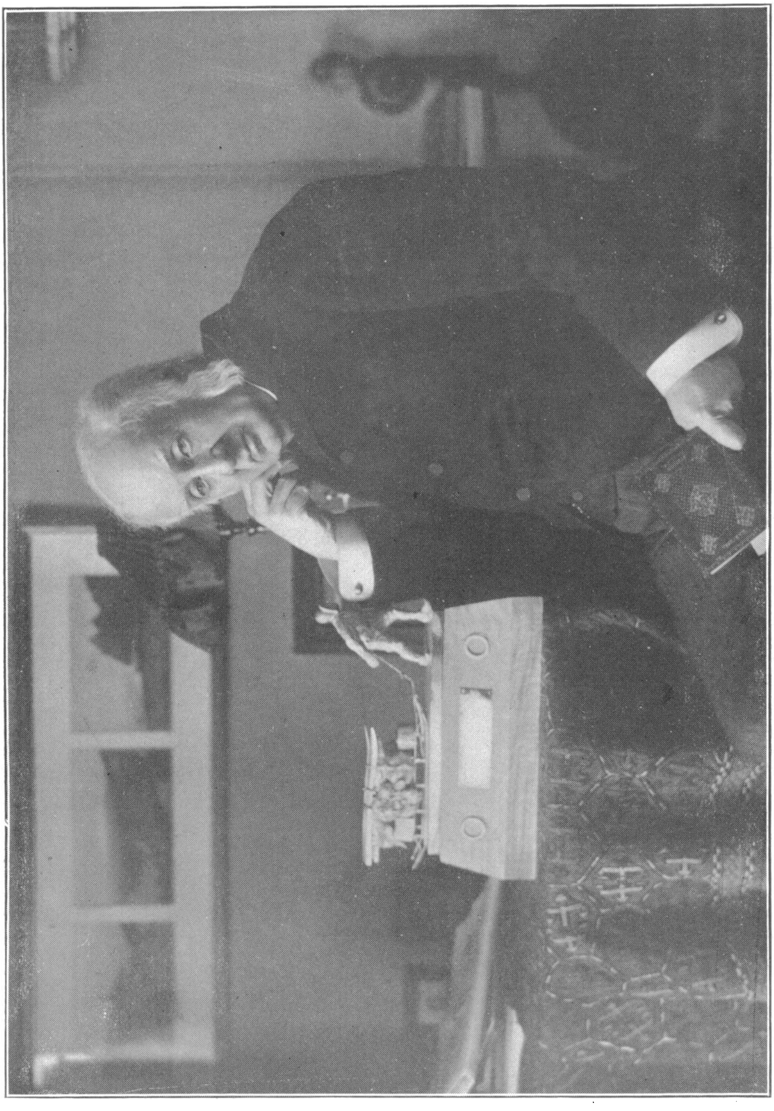
	Army	Navy
Great Britain	224,300	224,140
France	191,432	119,571
Russia	317,800	122,500
Italy	82,928	51,000
Germany	183,090	111,300
Austria-Hungary	82,300	42,000

Austria-Hungary and Italy about balance, as do also Turkey and Bulgaria, on the one side, and Servia, Belgium and the partial participation of Japan and Portugal, on the other. The expenditure of Great Britain, France and Russia on their armies was about four times that of Germany, but this does not measure their relative efficiency at the outbreak of the war. The militaristic spirit of Germany is in part due to the armaments of the nations surrounding it. A nation may pay for armaments which not only make war more likely but which may help the enemy when war comes. The strength of Germany was its educa-



Eugene Woldemar Hilgard,

Professor of agriculture in the University of California from 1875 until his retirement as professor emeritus in 1904, who has died at the age of eighty-three years.



SIR CLEMENTS ROBERT MARKHAM,
Long president of the Royal Geographical Society, who has died in his eighty-sixth year.

tional, social and industrial organization; its disaster is its military preparedness, which gave power to the military caste and led them to make war when and as they thought it could be waged victoriously. The strength of Great Britain on the seas is in its commerce, of which dreadnaughts are merely a dangerous symbol. The strength of a nation, even when at war, is not in armaments that can be purchased, but in its people and their institutions.

SCIENCE AND NATIONAL STRENGTH

It might have been supposed that a discussion on national defense and development before the American Association for the Advancement of Science would have been concerned chiefly with emphasizing the importance of scientific education, scientific research and scientific organization as leading factors in the maintenance of peace and of national efficiency in case of war. If the battle of Waterloo was won on the playgrounds of the English public schools, it may be that other battles have been lost in the colleges of Oxford. At all events the complaint is made in England that its relative lack of success is due to its neglect of science. The classically trained dilettante, the political doctrinaire, the lawyer politician, the military martinet, are not fit leaders of a nation. The strength of this nation is in its engineers and physicians, in its scientific men, few though they are, in the great mass of the people engaged in productive agriculture and industry. We have shown what we can do in our railways, our automobiles, our telephones, what we can not do in our municipal and state governments, an admixture of success and failure in our schools and in our industrial organization.

A billion dollars spent, as is proposed, on the army and navy, as now organized, would be an incitement to war and would only be of moderate use in a strictly defensive war. The armaments would soon become obsolete and other billions would be called for. A billion dollars spent on scientific education, on scientific research, on public health, or on public works, would be money invested in the way yielding the largest returns, and would accomplish more than armaments to make the nation strong in defense.

As the writer of this note urged before the war, we should have the best army for defense and improved police forces if all local police were soldiers, one twelfth of their wages being paid by the nation and one month annually being spent in camps and drills. Idling in barracks is a method for the promotion of war, drunkenness and disease. The engineering corps, the health service and the commissariat are the most important factors in modern warfare. Engineers, health officers, inspectors of food and others employed by the nation, the states and the municipalities should be at the same time officers in the army and those under them enlisted men. A well-organized and efficient army for defense would thus be maintained at comparatively small expense and be an institution for education instead of for demoralization.

The navy should be converted into a merchant marine, carrying a postal, express, freight and passenger service to every port in the world. At the cost of an idle navy five to ten times as many ships and men could be maintained and employed in useful work. In case of war swift ships and experienced men would win over dreadnaughts. Shipyards and factories for armaments and ammunition should be owned by the nation and manned by officers and enlisted men. The army and the navy can be made self-supporting nearly as easily as the postoffice.

If we had for the past three years employed a large force of men on the Mexican border to build railways and roads, irrigation dams and other public